

The IRP2010 methodology can be greatly improved with better results

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Current commitments must continue

- ▶ Commitments and advanced plans must be executed
 - ESKOM must build Medupi, Kusile and Return old plants to service and address peakload needs
 - DoE, NERSA must complete execution of Independent operator, IPPs and Cogen
 - The IRP2010 and these hearings cannot be accused of increasing the chance of “load sharing” and blackouts.
- ▶ The government and various departments are committed to review the IRP periodically.
 - For IRP2012 (or the next IRP) I propose a different and better methodology which will give better results.

Methodology for IRP2012

- ▶ The current IRP2010 is a slight variation of the Eskom expansion plan
 - It is not a national plan
- ▶ **A national plan must have the following features**
 - It must put comprehensive energy efficiency at the top of the agenda. Recommended by IEA and most energy experts. EE is by far the cheapest “source” of energy.
 - It must consider the full range of viable electricity generating technologies, large and small on and off grid.
 - These technologies must be evaluated with the same “objective” methods.
 - The current IRP2010 assumes that the initial Eskom coal only plan is the cheapest. This is not proven.

Methodology for IRP2012

- ▶ **A national plan needs a better Methodology**
 - **National Levelised costs– R/kwh**
 - It must use a low or even zero discount rate
 - Governments cannot discriminate against future generations. Zero discount rate.
 - This agreed by most authorities. Such as our Long Term Mitigation Strategy (LTMS), the Stern Review and the California Energy Commission.
- ▶ **All externalities must be taken into account**
 - The constitution makes the government responsible for health and clean water, climate change (water acidification)
 - Governments cannot legally ignore these, private companies can legally.

National vs Private levelised costs

▶ National

- Low discount rate (0..5%)
 - No discrimination against future generations
- Calculate for all technology options
- Externality costs
 - Government has constitutional responsibility for health, water quality etc. Cannot ignore
- Calculate over full life of plant (25–30years)
 - Load factors taken into account

▶ Private

- Higher discount rate (8% plus)
 - Shareholders short term view.
 - Ignores rising cost of fuel, pollution and carbon
 - Ignores free fuel for Renewables.
 - This arbitrary formula is biased against RE.
- Externality cost. Private can ignore.

Methodology for IRP2012

- ▶ Governments cannot ignore future generations and damage to health of communities and environment.
 - ESKOM and private companies can
- ▶ DoE circulated the component costs (capital, operations and maintenance, fuel decommissioning costs) of a full range of technologies
 - Using these costs and the NATIONAL LEVELISED COSTS methodology and use a 30 year life of plant very different results to IRP2010 are calculated.
- ▶ Rank the technologies by NATIONAL LEVELISED COSTS

Methodology for IRP2012

- ▶ In addition to NATIONAL LEVELISED COSTS ranking
 - Each technology ranked by
 - Environmental stress (not included in costed externalities)
 - Water reticulation costs
 - Water usage
 - Job creation
 - Local manufacturing
 - exports
 - Contribute to developmental state
- ▶ This should inform rational government policy
 - What technologies to encourage and discourage

National Levelised costs

Very different results.

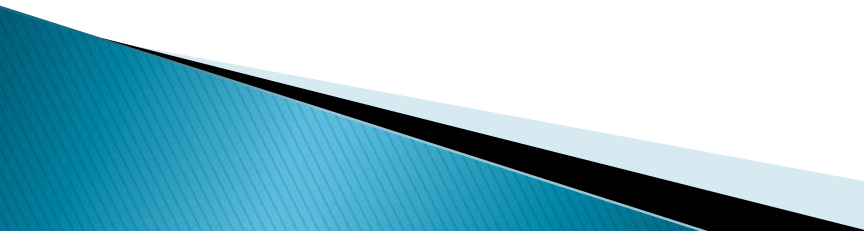
Technology	R/kwh
COAL Pulverised Coal (ignoring externalities) and distribution cost	R 0.299/kwh
Coal-PC- Central with distribution costs. Includes externalities Lose 16% power. Price 50% more	R1.010/kwh
Coal-PC. - Central with distribution costs, externalities. Lose 16% power. Price 100% more	R1.347/kwh
Wind onshore. Assume local and no distribution costs. No storage	R0.038/kwh
Rooftop photovoltaic. Local and no distribution costs. No storage	R0.488/kwh
Rooftop PV. Learning curve Estimated levelised cost in 2020	R0.187/kwh

National Levelised costs

Very different results

Technology	Costs R/kwh
Concentrated PV	R0.6125/kwh
Solar Thermal– Parabolic trough With 9 hours storage	R0.091 /kwh
Solar thermal– Central receiver With 9 hours storage	R0.427/kwh
Coal with van Horen Externalities. No distribution	R0.45/kwh
CSP with storage	R0.42/kwh
Geothermal	R0.13/kwh
Rooftop PV	R0.106/kwh

Evaluate realistic scenarios

- ▶ The current IRP2010 evaluated slight variations around the ESKOM plan
 - Like comparing cars and only looking at different BMW models
 - ▶ Need to evaluate many scenarios
 - Southern African “Desertec”. SAPP
 - WWF proposal
 - Greenpeace proposal
 - EE plus small wind and PV–on and off grid
 - Eskom plans
 - Invite LTMS team to propose.
 - IPP proposals
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Energy Commission

- ▶ There is a strong case for a highly qualified full time Energy Commission.
 - In the past there was no climate change threat.
 - There was no danger of oil peaking.
 - There was no threat to fossil-fuel electricity generation
 - Energy efficiency was not so urgent.
 - There were no meaningful renewable energy technologies
 - We were able to get by with ESKOM as a one technology monopoly, doing the electricity planning for the country.
- ▶ Energy and electricity is essential for development and eradicating poverty and can require R thousands of billions
 - Good sophisticated energy/electricity planning can save R hundreds of billions and get better results.

▶ Thank You

- ▶ Questions?
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